CLAIMS

1. A cooling fan system for a vehicle with fuel cell propulsion comprising a plurality of fuel cells, a heat exchanger, at least one cooling fan adapted to direct a cooling air flow through said heat exchanger, an air branching device adapted to branch off at least a part of the cooling air flow delivered by said at least one cooling fan, a duct for receiving said branched-off air flow and for directing it to said fuel cells for the purpose of at least one of starting of the fuel cells and maintenance of the operation of the fuel cells.

2. A cooling fan system in accordance with claim 1, wherein said air branching device is formed by a fixed guide wall.

3. A cooling fan system in accordance with claim 1, wherein said air branching device has a first position and a second position in which it brings about the branching off of air from said cooling air flow, said air branching device being movable between said first and second positions.

4. A cooling fan system in accordance with clam 1, wherein said at least one cooling fan is a pusher fan arranged upstream of said heat exchanger.

5. A cooling fan system in accordance with claim 4 and further comprising a housing disposed upstream of said heat exchanger, said at least one fan being connected to said heat exchanger by means of said housing.

6. A cooling fan system in accordance with claim 1 and further comprising an air guiding housing arranged downstream of said heat exchanger directly adjacent the latter.

7. A cooling fan system in accordance with claim 3, wherein said air branching device is realized by adjustable plates, said adjustable plates having a first position permitting air moving through said heat exchanger to pass between them and a second position in which they close against one another to supply air to said duct leading to said fuel cells.

8. A cooling fan system in accordance with claim 7, wherein said air guiding housing has a downstream side and said plates are arranged at said downstream side.

9. A cooling fan system in accordance with claim 7, wherein said plates are arranged in the manner of a louver window.

10. A cooling fan system in accordance with claim 7, wherein said plates are arranged in the manner of an iris diaphragm and have a first state closed against one another in which they define a central opening, said duct leading to said fuel cells having an entry and said entry lying opposite to said central opening.

11. A cooling fan system in accordance with claim 7, wherein said plates are arranged in the manner of a roller shutter.

12. A cooling fan system in accordance with claim 6, and further comprising an air collecting box, said air collecting box extending over a region of said air guiding housing not covered in the air branching position by said air branching device and being adapted to collect air branched off by said air branching device, said duct leading to said fuel cells having a connection and said air branched off by said air branching device being supplied to said connection.

13. A cooling fan system in accordance with claim 12, wherein said air collecting box has a collecting aperture and wherein said air branching device is formed by a roller blind having a closed position in which said roller blind adjoins said air collecting box, but does not close said collecting aperture.

14. A cooling fan system in accordance with claim 6, wherein said air guiding housing has an air outlet side, wherein said air branching device is adapted to completely close off said air outlet side and wherein said air guiding housing has a connection for said duct leading to said fuel cells.

15. A cooling fan system in accordance with claim 3, wherein a positioning motor is provided, said positioning motor being attached to said air guiding housing for the positioning of said plates.

16. A cooling fan system in accordance with claim 1 and further comprising a compressor having a housing and adapted to feed oxygen to said fuel cells in normal operation, wherein said duct leading to said fuel cells extends into said housing of said compressor.

17. A cooling fan system in accordance with claim 1, wherein said duct leading to said fuel cells leads directly to said fuel cells.

18. A cooling fan system in accordance with claim 6, wherein an air filter is provided in said air collecting box.

19. A cooling fan system in accordance with claim 1, wherein an air filter is provided in said duct leading to said fuel cells.

20. A cooling fan system in accordance with claim 1, wherein said cooling fan, said heat exchanger and said air branching device form a module.

21. A cooling fan system in accordance with claim 5, said housing connecting said at least one fan to said heat exchanger having a connection for said duct leading to said fuel cells.

22. A cooling fan system in accordance with claim 1 and adapted for said cooling air flow to satisfy at least one further cooling task after passing through said heat exchanger prior to being discharged into an environment of said cooling fan system.

23. A method for the operation of a fuel cell system comprising a plurality of fuel cells, a heat exchanger, at least one cooling fan adapted to produce a cooling air flow directed through said heat exchanger and a compressor for feeding compressed air to said fuel cell arrangement, wherein at least a part of said cooling air flow is supplied to said fuel cells for the purpose of at least one of:

starting the fuel cell system operating;

maintaining the operation of said fuel cells in a low load range during idling;

maintaining the operation of said fuel cells in a low load range during loss of speed by rolling; and

maintaining said fuel cells operating in a low load range during overrun operation.

24. A method in accordance with claim 22, wherein at least a part of said cooling air flow is also supplied to a reforming device connected in front of said fuel cells.